

REQUEST FOR RECONSIDERATION
UNDER 37 C.F.R. § 1.116
APPLICATION NO. 10/089,569
ATTORNEY DOCKET NO. Q68831

IN THE CLAIMS:

1. (Previously Amended) A tunable edge-emitting semiconductor laser comprising:
a resonant cavity delimited by a fixed reflector and an adjustable reflector;
an active section with a gain of length L_1 creating a first section of the resonant cavity; and
a tunable section of length L_2 creating a second section of the resonant cavity,
wherein a total length of the cavity $L = L_1 + L_2$ is less than or equal to 20 μm .
2. (Previously Amended) The tunable laser according to claim 1, wherein the length L_1 of the active section is from 5 μm to 12 μm .
3. (Previously Amended) The tunable laser according to claim 1, wherein the length L_2 of the tunable section depends on the tuning range of the laser in accordance with the following equation:
$$\Delta\lambda = \lambda^2/2(n_1L_1+n_2L_2)$$

where $\Delta\lambda$ is the tuning range of the laser,
 λ is the emission wavelength of the laser, and
 n_1, n_2 are the respective refractive indices of the first and second sections of the laser cavity.
4. (Previously Amended) The tunable laser according to claim 3, wherein the tunable laser has a continuous tuning range $\Delta\lambda$ greater than or equal to 30 nm.
5. (Previously Amended) The tunable laser according to claim 1, wherein the fixed reflector and the adjustable reflector each have a reflectivity greater than or equal to 90%.

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APPLICATION NO. 10/089,569
ATTORNEY DOCKET NO. Q68831

6. (Previously Amended) The tunable laser according to claim 1, wherein the fixed reflector is an etched mirror.
7. (Previously Amended) The tunable laser according to claim 6, wherein the etched mirror of the fixed reflector is an alternation of semiconductor and air.
8. (Previously Amended) The tunable laser according to claim 6, wherein the etched mirror of the fixed reflector is an alternation of polymer and air.
9. (Previously Amended) The tunable laser according to claim 6, wherein the etched mirror of the fixed reflector is an alternation of semiconductor and polymer.
10. (Previously Amended) The tunable laser according to claim 6, wherein the fixed reflector is on a front face of the active section.
11. (Previously Amended) The tunable laser according to claim 1, wherein a rear face of the active section is antireflection treated.
12. (Previously Amended) The tunable laser according to claim 1, wherein the adjustable reflector is a mirror external to the laser cavity.
13. (Previously Amended) The tunable laser according to claim 12, characterized in that the adjustable reflector (20) is of etched silicon.

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14. (Previously Amended) The tunable laser according to claim 12, wherein that the adjustable reflector is of nickel.

15. (Previously Amended) The tunable laser according to claim 12, wherein the adjustable reflector is of dielectric deposited on silicon.

16. (Previously Amended) The tunable laser according to any one of claims 12, wherein the mobile reflector is controlled by a micro-electro-mechanical (MEM) controller.

17. (Previously Amended) The tunable laser according to claim 1, wherein the tunable section is an air area.

18. (Previously Amended) The tunable laser according to claim 1, wherein the tunable section is a gas area.

19. (Previously Amended) The method of fabricating a tunable edge-emitting semiconductor laser according to claims 1, further comprising of:

producing a laser die including a substrate and an active layer consisting of a gain medium, the length L_1 of the gain medium being from 5 μm to 12 μm ,
fabricating a fixed etched mirror on the front face of the laser die,
mounting the laser die on a base and
producing a mobile reflector (20) on the base (50) to the rear of the laser die (10).

20. (Previously Amended) The method according to claim 19, wherein fabricating the etched mirror further comprises:

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APPLICATION NO. 10/089,569
ATTORNEY DOCKET NO. Q68831

etching the active layer of the laser die,
depositing a polymer in the etched area, and
etching the polymer to constitute a mirror.

21. (Previously Amended) The method according to claim 19, wherein fabricating the etched mirror further comprises:

etching the active layer of the laser die,
furthering epitaxial growth in the etched area of an undoped semiconductor transparent at the
emission wavelength, and
etching the transparent undoped semiconductor to constitute a mirror.

22. (Previously Amended) The method according to claim 21, wherein fabricating the etched mirror further comprises of depositing a polymer in the etched regions of the transparent undoped semiconductor.